Model to Evaluate Virtual Learning Environment among Malaysian Teachers

Hapini Awang, Wan Rozaini Sheik Osman, Zahurin Mat Aji

Abstract: The sophisticated improvement of Information and Communication Technology (ICT) has sparked new inventions in teaching and learning approach. These positive technological advantages therefore inspired the Malaysian Ministry of Education (MOE) to invest in digitalizing the Malaysian schools, including the implementation of Frog Virtual Learning Environments (VLE). Despite this huge investment, the ratio of usage is relatively low, especially among the teachers. This evidence indicates that there is an urgent requirement to conduct a post-implementation evaluation to investigate the factors behind the issue. Therefore, this study is conducted to develop a conceptual model based on the updated DeLone and McLean IS Success Model to evaluate the Frog VLE success among Malaysian teachers. As the study is still in the early stage, this paper will present the initial investigation that leads to the development of the conceptual model, including background of the study, the objectives, literature review and research methodology that the study wishes to employ. Based on this conceptual model, 14 hypotheses have been proposed.

Keywords: DeLone and McLean IS Success Model, Evaluation of IS Success, Frog VLE, Learning Management System
Jel classification: A29, O33

I. INTRODUCTION

The sophisticated improvement of Information and Communication Technology (ICT) has sparked new inventions in teaching and learning approach. Currently, most educational institutions have implemented various forms of teaching style such as blended and online learning. Blended learning combines face-to-face teaching with an unusually high percentage of autonomous learning and online tutoring. These new teaching styles are made possible through Virtual Learning Environments (VLEs) (Berns et al., 2013).
VLE is defined a decade ago as computer-based environments that are relatively open systems, allowing interactions with other participants and access to a wide range of resources (Wilson, 1996).

The virtual environments offer various benefits compared to the traditional approach by promoting
the "any time/any place" learning model (Ahmad et al., 1998). The introduction of VLE technology in education has significantly shifted the nature of traditional learning in six aspects; time, place, space, technology, interaction, and control (Piccoli et al., 2001). VLE is commonly recognized as an Internet-based platform that supports various educational activities including online courses, quizzes, and tutorials (Abdelhag et al., 2014). The introduction of VLE technology into education has produced positive impact to the parent, students, and teachers (Nor Fadzleen and Halina 2013) by promoting the dynamicity in learning particularly in conditions of opposing the barriers of time and location (Uzunboylu, H., Bicen & Cavus, 2011). The technology also enables users to mutually interact with each other, both synchronously and asynchronously (Halonen et al., 2012).

II. LITERATURE REVIEW

The VLE technology implementation in Malaysia was initiated by Ministry of Education (MOE) through the 1BestariNet project to improve the previous version of SchoolNet service (Kementerian Pendidikan Malaysia, 2014). Through the initiative, MOE aims to connect approximately over 10,000 schools across the nation via cloud-based virtual learning environment, supported by high-speed 4G internet connections by the end of 2013 (Kementerian Pendidikan Malaysia, 2013). As a long term investment, the 1BestariNet (including Frog VLE) executions is expected to run for at least thirteen years and MOE believed that it will transform Malaysian education sector by promoting sustainable use of ICT in both areas of pedagogy (teaching and learning) as well as education management (Abdullah et al., 2013; Cheok & Wong, 2014).
Frog VLE, adopted from the United Kingdom (UK), is the most recent Learning Management System (LMS) implemented in Malaysian schools. One of the ultimate objectives of this initiative is to connect the educational separate among rural and urban schools by providing equal digital education for every student, regardless of their locations. It is hoped that over 10,000 public schools, 5

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million students, 500,000 teachers, and 4.5 million parents will be connected together in the virtual learning community, and therefore boost the quality of Malaysian education up to the highest level. However, the current report indicates low usage of Frog VLE, which is between 19.5% to 33.5%, with only 0.57% to 4.69% of teachers' usage (Kementerian Kewangan Malaysia, 2014).

The low utilization of Frog VLE in schools is associated with at least two issues. First, a recent evidence has demonstrated that some teachers refuse to continue using the system, although they agreed on the benefits offered by Frog VLE (Cheok & Wong, 2016) Second, some studies also suggest an association between user satisfaction and the actual usage of LMS (Eom et al., 2012). This notion implies that the teachers who are not satisfied with the Frog VLE will most likely refuse to continue using it and henceforth contribute to the overall statistic of low usage. Nevertheless, the current literature on Frog VLE is found to be widespread with the lack of empirical evidence on its continuous usage and user satisfaction. Therefore, there is a need to empirically examine the factors behind both of these issues, particularly among the teachers.

Regarding the trend of recent studies in Frog VLE, it is becoming extremely difficult to ignore the existence of teachers' excessive workload as a major hindrance of its utilization (Abdullah et al., 2013). While the body of research in the area suggests that excessive workload may also have some impact on the use of Frog VLE (Abuhmaid, 2011) empirical evidence on this is still lacking. Moreover, the literature is yet to reveal any attempt to structurally map out the relationship between workload and usage in the context of IS success.

Equally important, the Personal Characteristics like Age, Gender and Experience are found to be influential in IS adoption especially in determining the strength of usage (Venkatesh et al., 2012). However, the plausible effect of these Personal Characteristics in evaluating Frog VLE success has not yet been clarified, so it is not obvious whether these characteristics are influential or the otherwise. This implies that the existing literature on IS evaluation lies on insufficient research in determining its predictors and thus requires further empirical investigations.

The Updated DeLone and McLean IS Success Model

Various theories and designs related to IS usage have been introduced including Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT). Nevertheless, IS usage is not representing the overall IS success, however it is one amongst IS success is that the interconnected (Delone & McLean, 2003; DeLone & McLean, 1992). In step with Delone & McLean, (2003), IS success is the interrelated dimensions, so it mustn't be measured supported solely single dimension. This stance implies that many studies that examine sure dimension, for instance, IS usage (AlAwadhi & Morris, 2008; Jurisch, 2015) and user satisfaction (Chang et al., 2009; Dai et al.,

2011) failed to represent the full construct of IS success. In addition, the continuous usage during the post-implementation stage is more significant in determining the IS success compared to initial use during pre-implementation (Bhattacherjee, 2001). As for this study, the continuous usage is identified as a prominent issue, illustrated by the low usage of ICT and Frog VLE (Hassan & Kamisah 2010). Even though majority of the teachers have the initial Frog VLE experience, the current finding shows that they refused to continue using the system (Nor Azlah et al., (2014) that replicate that the system isn't on the correct track of success.

From the literature, this study found that these problems can be engaged utilizing the updated DeLone and McLean IS Success Model (D&M) (Delone & McLean, 2003). Previous research have proven that this model suits all the dimension for IS success assessment (Mohammadi, 2015; Al-Debei et al., 2013). Therefore, this study uses the D&M IS Success Model as the theoretical basis, with the inclusion of Workload and Personal Characteristics as the external moderating variable to measure the Frog VLE Success among Malaysian teachers. Although the updated D&M IS Success Model was developed for measuring e-commerce, its applicability in other IS streams has been proven by many studies. This model was introduced on 2003 as the response to the criticisms on the original version of IS Success Model by (DeLone & McLean, 1992). As an enhancement model, several adjustments have been made including the inclusion of Service Quality (SeQ) and the combination of Individual Impact and Organizational Impact into the single dimension known as Net Benefits (NB). Furthermore, the updated D&M purpose to supply a complete know-how of IS success with the aid of describing the inter-dating between six recognized dimensions, namely Information Quality (IQ), System Quality (SyQ), Service Quality (SeQ), Intention to Use (ITU) or Use (U), User Satisfaction (US) and Net Benefits (NB), is proven in Fig. 1.
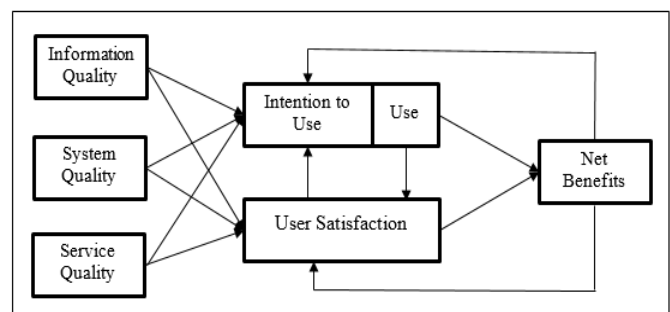

Fig. 1The Updated DeLone and McLean IS Success Model

Delone & McLean, (2003) suggested that their model should be continuously tested and challenged under various context, in order to increase its validity and reliability. For this reason, the previous researchers have made various alterations and refinement to the model. Nonetheless, the

updated D&M remains the foundation model of these IS success evaluation studies. For example, a major study by (Mohammadi, 2015) that investigate the factors that influence E-Learning outcomes has included a number of external variables into D&M including Educational Quality, Perceived Ease of Use, Perceived Usefulness, and Learning Assistance. In another study by (Al Zoubib & Jali, (2014), the relationships in D&M have been modified along with the inclusion of Relative Advantage, Compatibility, and Complexity to measure E-Learning adoption among adults workers. Also, some researchers choose to hybridize D&M by integrating it with other models or theories such as TAM and VLE Effectiveness Model (Eom et al., 2012). Despite the variability in adapting the D&M model (to suit the objectives and context of studies), the majority of researchers still believed that most of the constructs in the model are relevant for the evaluation of IS Success across different context and should be retained (Alshibly, 2014).

Based on the preceding discussion, this learning terminates that the entire constructs in D&M are relevant to model the Frog VLE success among Malaysian teachers. More importantly, the preservation all IS Success dimensions is congruent to the suggestion of [20] to produce a comprehensive understanding the IS achievement whereas at a similar time retaining the nature of interdependency between these dimensions. However, to analyze the issue of non-stop usage (why the teacher refuse to continue using Frog VLE?); this study will use both ITU and U while also adding the new relationship from U to ITU. Although the ITU was introduced by [20] as an alternative measurement for U, the separation of these two constructs will enhance the explanation power of D&M (Agarwal & Prasad, 1997); Mardiana, 2015). In addition, this study will also incorporate the WL as the moderator since it has identified as a major issue that affects the ICT integration in education including Frog VLE, (Wu et al., 2010). Finally, the Personal Characteristics, which consist of Age, Gender and Frog VLE Experience, will be added to the D&M as another moderating variable, which is expected to influence the relationship between the Quality Dimensions (IQ, SeQ and SeQ) and ITU.

III. RESEARCH OBJECTIVES AND QUESTIONS

This learning seeks to provide some understandings on how the new Conceptual Model that's developed supported the D&M IS Success Model (Delone & McLean, 2003). Will predict the success of Frog VLE among Malaysian teachers. Additionally, this study also wishes to address the following main questions:
a)   Is the modified D&M suitable for the post-implementation evaluation of Frog VLE?
b)   Why are the teachers not using the Frog VLE?

Research Conceptual Model

The Conceptual Model for the projected learning, as shown below (

Fig. **2**), relies on the renewed DeLone and McLean IS Success Model (Delone & McLean, 2003). Comprises of

eight interdependent determinants of success, this model suggests that the Quality Dimensions (Information Quality, System Quality, and Service Quality) will significantly influence the Aim to Use and User Satisfaction. Furthermore, the Personal Characteristics (Age, Gender and Frog VLE Experience) may moderate the relationship between the Quality Dimensions and Intention to Use. At the second level, the increasing Intention to Use should lead to more usage (Use) of the Frog VLE. By the same manner, the initial Use may also affect future Intention to Use, with the mediating effect of User Satisfaction. As a result of these Use and User Satisfaction, certain Net Benefits will occur, that will further lead to improvement of Intention to Use (moderated by

Workload of the teachers) and User Satisfaction. At the same time, the teachers' employment is additionally expected to moderate the link between Intention to Use and Use of Frog VLE.
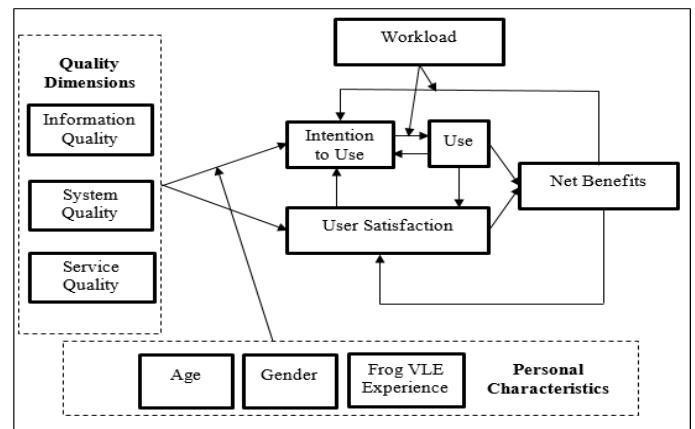

Fig. 2 Research Conceptual Model

Hypotheses

This study postulates that the Quality Dimensions will influence the ITU of Frog VLE among Malaysian teachers, in the positive relationship. This assumption was supported by several previous research which proved a significant connection among IQ, SyQ and SeQ to the ITU (Al-Debei et al., 2013; Ramayah et al., 2010). Hence, the subsequent main hypothesis is planned, and therefore the elaborate discussion of the sub-hypotheses is provided within the next paragraphs.

H_1: The Quality Dimensions have the significance influence on the Intention to Use of Frog VLE among the teachers.

First, as a kind of IS, the standard of knowledge given by Frog VLE is one of the crucial criteria of success in ensuring the continuous usage or intention of future use of the system (Al-Debei et al., (2013). Several recent studies investigating the relationship between IQ and ITU have been carried out by

IS researchers. As a result, data from these studies have identified both significant (Chen et al., 2009; Iivari, 2005) and insignificant (Halawi et al., 2008) of this relationship. Second, SyQ should have directly affected the ITU; even though the density of the relationship may vary across different IS atmosphere (Teo et al., 2008). In this sense, it can be assumed that the Frog VLE that always available, easy to use and convenient to access will lead to greater aim to utilize within the future by teachers. Nevertheless, the previous studies have demonstrated the mix supported relationship between theses variables. Some studies have found that SyQ is not related to ITU (Agarwal & Prasad, 1997; Klein, 2007), while many other studies found it significant (Al-Debei et al., 2013).

Third, on the practical basis, good support services by Frog VLE and 1BestariNet should motivate the teachers to continue utilizing the system within the future. However, empirical examinations by a number of previous studies have shown that SeQ only had a mixed support for its ability to explain ITU (Al-Debei et al., 2013). Building on the previous arguments and the inconsistency on the findings, this study believed that it the further exploration of the above-mentioned relationships are urgently needed. Therefore, the following sub-hypotheses are proposed:

H_{1a}: Information Quality has a significance influence on the Intention to Use of Frog VLE among the teachers.

H_{1b}: System Quality has a significance influence on the Intention to Use of Frog VLE among the teachers.

H_{1c}: Service Quality has a significance influence on the Intention to Use of Frog VLE among the teachers.

This study postulates that if the teachers satisfied with the Frog VLE in term initial use, information quality, system quality and service quality, they will be inspired to use it again in the future. This notion is further supported by [30] who suggest that the individual who satisfied with the technology may have higher intention to use it in the future due to the positive reinforcement of attitude toward the technology. Moreover, the relationship between US and ITU has been supported in a number of empirical studies ((Al-Debei et al., 2013; Wixom, 2005; Halawi et al., 2008). In light of this, this study proposes the following hypothesis:

H_2: User Satisfaction has a significance influence on the Intention to Use of Frog VLE among the teachers.

According to the updated D&M IS Success Model [20], the initial use and the intention to use in the future can be different under certain circumstances. By referring to two important studies by Agarwal & Prasad (1997) and Karahanna et al., (1999), the model described that the positive experience with the initial use should lead to user satisfaction and thus increase the attitude toward usage in the future. Comparatively, this study (post-implementation) assumed that all the teachers are continuance users as all the teachers are provided with personal IDs by 1BestariNet and required to create Frog VLE account (1BestariNet, 2012). Therefore, the positive initial use of Frog VLE is expected to increase their intention to continue using it in the future. Considering the preceding discussion, this study proposes the following hypothesis:

H_3: Use has a significance influence on the Intention to Use of Frog VLE among the teachers.

The positive NB is expected to lead to future ITU [20]. In other words, the teachers will intent to continue using Frog VLE if they perceived that the system is beneficial to them. Moreover, the relationship between NB and ITU also has been supported by the number empirical studies (Al-Debei et al., 2013; Fang et al., 2011; Zheng et al., 2013). Therefore, this study proposes the following hypothesis:

H_4: Net Benefits has a significance influence on the Intention to Use of Frog VLE among the teachers.

This study postulates that the Quality Dimensions will influence the US of Frog VLE among Malaysian teachers, in the positive relationship. This assumption was supported by the previous studies that proved the significant relationship between IQ, SyQ and SeQ to the US (Al-Debei et al., 2013). Therefore, the following main hypothesis is proposed, and the detailed discussions of the sub-hypotheses are provided in the next paragraphs.

H_5: The Quality Dimensions have the significance influence on User Satisfaction of Frog VLE among the teachers.

IQ will positively influence US on the direct relationship [20]. In other words, the user will be satisfied if the IS produced precise, updated, relevant, and appropriate information. Thus far, a growing body of empirical research that examined the correlation between these two IS success dimensions can be found (Al-Debei et al., 2013). Hence, in the context of this study, the good quality of information provided by Frog VLE should increase the teachers' satisfaction. Furthermore, SyQ was also found to have a strong positive relationship to US by a number of studies conducted to date (Urbach & Müller, 2012). For example, both empirical studies conducted by Al-Debei et al., (2013) and Aggelidis et al., (2012) have found a strong relationship between SyQ and US. Hence, this study assumed that the good quality of Frog VLE that is always available, easy to use and learn, convenient to access and reliable will lead to positive teachers' satisfaction. On the other hand, higher service quality is expected to lead to higher user satisfaction as well at the individual level of analysis [[20]. Thus, this study postulates that if the teachers received the good services by Frog VLE and 1BestariNet, they will likely to feel satisfied and intend to continue using the system. However, empirical examinations by a number of previous studies have shown that SeQ only had a mixed support for its ability to explain US (Urbach & Müller, 2012). Nevertheless, the literature in the discipline of LMS evaluation, particularly in the Malaysian context, is yet to reveal any attempt to empirically test this relationship. Therefore, considering the preceding discussion, the study proposes the following sub-hypotheses:

H_{5a}: Information Quality has a significance influence on the User Satisfaction of Frog VLE among the teachers.

H_{5b}: System Quality has a significance influence on the User

Satisfaction of Frog VLE among the teachers.

H_{5c}: Service Quality has a significance influence on the User Satisfaction of Frog VLE among the teachers.

The updated D&M posits that the positive experience with the initial U of IS will lead to higher US [20]. In light of this, the teachers are expected to feel satisfied if they have experienced the positive use of Frog VLE. Empirically, the literature has demonstrated the moderately supported relationship between U and US (Urbach & Müller, 2012), which requires further investigation. Therefore, based on this argument, this learning projected the subsequent theory:

H_6: Use has a significance influence on the User Satisfaction of Frog VLE among the teachers.

In addition, the updated D&M also suggest that the NB will have the correlation to the US [20]. The positive NB supposed to trigger the positive US and the other way around. In addition, the reversed back effect from NB to US has shown to be very robust (Urbach & Müller, (2012). Build on the preceding arguments; this study postulates that the positive net benefits provided by Frog VLE will increase the teachers' satisfaction toward the system itself. Therefore, the following hypothesis is proposed:

H_7: Net Benefits has a significance influence on the User Satisfaction of Frog VLE among the teachers.

The ITU is a measure of the likelihood a person will employ an application (Al-Debei, 2013). The concept of people's intention to use certain technology was introduced by Davis, 1989) in TAM. This model uses the 'Behavioral Intention to Use' construct as an antecedent to predict the actual Use of the specific technology. This positive use will later cause satisfaction and intention for future use and so on. Based on this premises, Mardianaet al., 2015) also suggest that the ITU should be the predictor of U in D&M. In addition, this relationship between ITU and U has also been supported by a number of empirical studies (Mohammadi, 2015). Based on the preceding discussion, the study hypothesized that the teachers' intention to use Frog VLE in the future will positively influence its actual usage. Therefore, the subsequent theory is projected:

H_8: Intention to Use has a significance influence on the Use of Frog VLE among the teachers.

Delone (2003) suggested that certain net benefits would occur when the user used the particular IS. Hence, this study hypothesizes that the teachers will capture some benefits in term of time-saving, improved productivity and personal valuation when they use the Frog VLE. Empirically, the relationship between these two IS Success dimensions was found to be moderately supported (Petter, 2008). Considering the inconsistency in the previous findings, this study believed that the further investigation is required. Therefore, the subsequent theory is projected:

H_9: Use has a significance influence on the Net Benefits of Frog VLE among the teachers.

Meanwhile, certain NB will occur as a result of U and US [20]. On the practical basis, the teachers who are satisfied with the Frog VLE should believe that they would save time,

improve productivity and increase their personal value when using it. A review of the current state of research on D&M by [53] has shown that the relationship of US and NB were strongly supported by the previous empirical studies including those conducted by prominent researchers such as (Iivari, 2005). Considering these findings, this study will also expect the similar outcome, and hence projected the subsequent theory:H_{10}: User Satisfaction has a significance influence on the Net Benefits of Frog VLE among the teachers.

As discussed earlier, Delone (2003) suggested that the good experience with the initial U of Frog VLE is expected to cause the positive US, and further lead to increase in ITU. In this sense, the positive relationship between U and ITU should only exist with the mediating effect of US. In other words, the teachers (who have already experienced the initial use) are assumed to have an intention for future use, only if they were satisfied with the initial use of Frog VLE. Therefore, this learning projected the subsequent theory:

H_{11}: User Satisfaction mediates the relationship between Use and Intention to Use of Frog VLE among the teachers.

In this study, the Personal Characteristics, which consist of Age, Gender and Frog VLE Experience, were posited to play the moderating role in the connection among Quality Dimensions (IQ, SyQ and SeQ) and Intention to Use (ITU). Therefore, the following main theory is projected. The next paragraphs will thoroughly discuss the antecedents of this main hypothesis.

H_{12}: Personal Characteristics moderates the relationship between Quality Dimensions and Intention to Use of Frog VLE among the teachers.

During the past 50 years, much more evidence has become available on the effect of age toward IS adoption, especially in the context of intention to use the technology (Lin et al., 2013; Taylor, 1975; Venkatesh et al., 2003). Some researchers suggest that the age reflects the variation of human capability in processing information that further interfere their reaction toward the IS (Venkatesh et al., 2012). Compared to the younger people, the older people are found to rely more on automatic information processing (Jennings & Jacoby, 1993), and therefore require the better quality of information. Moreover, the increased age will usually cause the difficulty in processing complex information and to stay focus on the job, which both are necessary in IS adoption (Venkatesh et al., 2003). Hence, the older teacher is expected to feel less interested in using Frog VLE if they found that the information and system quality is low.

In the context of IS usage, the previous studies have explained that the older worker tends to require more assist and help in performing the job, which is usually caused by the physical and cognitive limitation associated with the aging process (Venkatesh et al., 2003). Under those circumstances,

the older IS user is believed to face greater obstacles in processing the new and complex information that will further affect their ability to learn the recent technologies (Morris et al., 2005).

As a result, they tend to rely more on the greater support and service quality to perform certain task (Venkatesh, et al., (2012). This study posits that the older teachers will require better information, system and service quality from Frog VLE in order to integrate it into their teaching activities. This assumption is supported by a number of empirical studies that demonstrated the effect of teachers' age toward the ICT usage in schools (Hindman, 2000). Based on the preceding discussion, this study postulates that the older teachers will demand higher information, system and service quality by Frog VLE and 1BestariNet. Therefore, the following sub-hypotheses are proposed:

H_{12a}: Age moderates the relationship between Information Quality and Intention to Use of Frog VLE among the teachers.
H_{12b}: Age moderates the relationship between System Quality and Intention to Use of Frog VLE among the teachers.
H_{12c}: Age moderates the relationship between Service Quality and Intention to Use of Frog VLE among the teachers.

Meanwhile, the empirical evidence shows that perceived usefulness (one of the measurements for information quality) was more salient for men compared to the women (Venkatesh et al., 2003; Venkatesh, & Morris, 2000). Men are commonly task oriented, and thus the desired quality of information is important to perform a certain task at hand (Venkatesh et al., 2003), such as in this case, for teaching. On the other hand, women are found to be more sensitive and detailed especially in making decisions (Meyers-Levy & Tybout, 1989). This is primarily attributed by the reality that they often tend to process every element of information in a structured manner, while men are most likely to ignore some relevant details and process the information from broader perspective (Meyers-Levy& Maheswaran, 1991). In light of this Venkatesh et al., (2012) suggested that the women will be more sensitive to changes in the environment that will further affect their intention. This notion was also supported by a number of empirical IS studies that uncover the greater effect of perceive ease of use (one of the measurements for system quality) among the women (Venkatesh, et al., 2003). This evidence suggested that women will expect better system quality that is not difficult to utilize (Venkatesh, et al., 2003), and henceforth if they perceived that the particular system is difficult to use, they will most likely demand the greater service quality.

Indeed, the factor of age and gender are closely related to each other and should be examined together (Levy, 1988). Gender differences and the dependence on service quality will become more salient with the increasing age (Morris, et al., 2005). As the human being getting older, the distinction in the gender roles will become more compelling and women are generally will place more reliance on better external support or service quality (Venkatesh et al., 2012). In summary, the previous discussion on the gender roles has demonstrated that the intention to use Frog VLE among the teachers will most likely

be influenced by the gender differences. Male teachers are expected to demand better information quality, while female teachers will mostly be influenced by the system and service quality. Based on the preceding consideration, this study therefore proposes the following sub-hypotheses:

H_{12d}: Gender moderates the relationship between Information Quality and Intention to Use of Frog VLE among the teachers.
H_{12e}: Gender moderates the relationship between System Quality and Intention to Use of Frog VLE among the teachers.
H_{12f}: Gender moderates the relationship between Service Quality and Intention to Use of Frog VLE among the teachers.

Experience as suggested in UTAUT and UTAUT 2 refers to "an opportunity to use a target technology and is typically operationalized as the passage of time from the initial use of a technology by an individual" [19]. Hence, in this study, it is referred to the teachers' experience with the Frog VLE. Frog VLE experience can also moderate the relationship between SeQ and ITU, as suggested by [19]. By referring to the groundbreaking studies conducted by (Hutchinson, 1987), the greater experience is expected to lead to greater familiarity with the specific system and thus reducing the reliance to the external supports.

Even though the factors of age and gender are found to be influential in the previous studies, the effect of these factors were also expected to decrease with the increasing of experience (Venkatesh et al., 2003). To elaborate, gender differences in learning new technologies will usually increase in parallel with age and the aging process will cause the declining in information processing ability. As the men are most likely will process information based on their preceding experience, the older women tend to process the information in more detailed and cautious manner (Venkatesh et al., 2012). In this sense, the older women are expected to be less influenced by their heuristic experience. In one of the prominent study to determine the role of prior experience, perceived usefulness is found to be more pronounced with increasing experience, that is the IS user will psychologically believe that the information provided by the particular IS is useful to them as they are getting familiar with it (Taylor, & Todd, 1995). This finding proved that the role of prior experience is crucial in the context of IS usage, particularly to determine the strength of the relationship between information quality and intention to use.

Additionally, the perceived complexity should also decrease as the ease of use will turn to be more pronounced with the increasing experience (Szajna, 1996; Thompson, et al., 1994). In comparison, the dependency to the external support is usually more noticeable for the less experienced people (Thompson, et al., 1994). Similarly, the experience can also be a moderator between service quality and intention to use because the increasing familiarity to the IS will enhance the user's knowledge structure that will assist the learning process, and hence reducing the dependency to the external

support or services (Hutchinson, 1987). Besides, the dependency on the service quality is more noticeable to the older woman in the early stage of technology adoption (less experience) since they are most of the time put to the effort of learning the new technology [19]. In the context of this study, the effect of quality dimensions is expected to be moderated by Frog VLE experience. Likewise, the effect of these personal quality dimensions will gradually

become lesser as the teachers getting familiar with the system. The greater Frog VLE experience by the teachers should positively increase the familiarity and finally should lead to decreasing dependency on external support, particularly from 1BestariNet helpdesk services. Therefore, the following sub-hypotheses are proposed:

H_{12g}: Frog VLE Experience moderates the relationship between Information Quality and Intention to Use of Frog VLE among the teachers.

H_{12h}: Frog VLE Experience moderates the relationship between System Quality and Intention to Use of Frog VLE among the teachers.

H_{12i}: Frog VLE Experience moderates the relationship between Service Quality and Intention to Use of Frog VLE among the teachers.

A report produced by Association of School and College Leaders, (2014) has defined Workload (WL) as "Work done for perceived and/or unnecessary compliance processes which take teachers away from the complex process of teaching and learning". In addition, it is also related to the teachers' professional duties and responsibilities such as teaching, community services, professional development and interaction with students (Yuker, H. E. (1984). In the context of LMS implementation, it is considered as one of the factors that possibly influence the utilization of the particular system. The issue of excessive Workload has been acknowledged by many previous researchers, particularly in the field of ICT in education (Wu et al., (2010). Unfortunately, the empirical evidence is still rare to be found regarding the issue, especially in Malaysia.

For instance, Hu et al., (2003) suggested that WL can severely hinder the teachers from adopting technology. Accordingly, the case study by Cheok & Wong (2016) found that WL is one of the major influence that interferes their predetermination to use of Frog VLE, even though they are aware of those particular benefits. Since the last century, the task of teachers has rapidly grown and the complaints of heavy Workload has become common among them (Ballet & Kelchtermans (2009). In light of this, Inan & Lowther (2010) suggested that the future research on ICT integration in education should include the factor of Workload, as they believed that it will extend the explanations from the existing literature. Also, the similar issue (Workload) has also become the concerns for several other IS researchers in Malaysia, which requires further explanations and more empirical evidence Anuar and Mohd Nordin (2015).

Based on the preceding discussion, this study postulates that WL will negatively moderate two relationships, namely; NB

to ITU and ITU to U of Frog VLE among the teachers. The teachers with the higher WL are expected to have lower intention to use Frog VLE even though they are agreed that Frog VLE provides benefits to them, while at the same time should negatively influence the usage. Thus, the following hypothesis is presented:

H_{13}: Workload moderates the relationship between Net Benefits and Intention to Use of Frog VLE among the teachers.

H_{14}: Workload moderates the relationship between Intention to Use and Use of Frog VLE among the teachers.

IV. RESEARCH METHODOLOGY

A cross-sectional survey field study will be employed in this study, as the data will be collected at a single point in time. Applying a survey method is believed to be the most appropriate to choose because it is an accurate mean to gather information as well as enable the researchers to generalize the findings, from the sample to a population (Creswell, J. W. (2013). This method is also suitable for a research with the large sample size, as the survey is quick, cheap and efficient to administer (Sekaran & Bougie (2016). Finally, a survey is also suitable when asking the respondents about their thought, opinions, and feelings (Shaughnessy et al., (2012).

Sampling

This study will use the probability sampling method to reduce the bias and increase the generalizability of the findings. Table.1 summarizes the sampling design of this study. The simple random sampling will be used. Based on the predetermined sample size required for this study, 45 the schools will be selected from sampling frame using the random calculator. From each selected school, 10 teachers will be chosen as respondents, using 'fishbowl draw sampling' technique. This will total up to approximately 450 of sample size (45*10 = 450).

Instrument Design

This study will systematically develop the inquiry that meets the research objectives based on the proposed Conceptual Model. The inquiry is divided into three sections; A, B, and C. Section An aims to gather the demographic data of the respondents.

Section B is purposely designed to measure the eight constructs, namely IQ, SyQ, SeQ, ITU, U, US, WL, and NB. Respondents are asked to circle the appropriate response. In addition, an introductory statement for every construct of the research model has been added within the inquiry. For the reason of validation, experts in the study field will revise the formulation of these statements before conducting the pilot study.

For every construct, the measurement scale is a seven-point Likert Scale, which ranges from 1 to 7 ['1' Extremely Disagree to '7' Extremely Agree]. This study applies the seven-point Likert Scale because it provides more widely spread scale values compared to five-point Likert Scale and thus reduces the possibility of respondent's bias - by just selecting a neutral value (Dwivedi et al., (2010). In fact, the seven-point Likert Scale has also been applied by many prominent researchers in the IS discipline (Seddon & Kiew, 1996).

Table.1 Sampling Design of the Study.

Concept / Terminology	The Current Study
The Theoretical Population	The teachers throughout the Malaysia.
The Study Population	The teachers in the Northern Region of Malaysia.
Sampling Frame	List of schools in the Northern Region of Malaysia.
The Sample	450 teachers

Data Analysis

The data analysis process will be conducted in two phases. In the first phase, IBM SPSS Statistics (SPSS) will be used for data entry, screening, and preparation, for the purpose of identifying missing and non-compliance data before starting the main analysis. Finally, in the second phase, Structural Equation Modelling (SEM) will be used for hypotheses and model testing. In addition, the CFA will be conducted at this stage to confirm the factor structure extracted previously during EFA. According to Hair et al., (2011), SEM is an appropriate multivariate method to test the complete theories and concepts. Moreover, it enables the researcher to conduct systematic and comprehensive testing of the interlinked variables and their items in just a single run (Gefen et al., (2000).

IV. CONCLUSION

This paper has presented the initial stage of the study which comprises of introduction, objectives, literature review, conceptual framework and research methodology that will be employed. From the literature analysis, the research issues and the gaps have been identified. Building on this, a research conceptual framework is developed to evaluate the Frog VLE success among Malaysian teachers. Furthermore, this study will be beneficial to the researchers in both domains, IS, and education by contributing in the following ways.

First, this study will examine the applicability of D&M Model to evaluate the success of Frog VLE implementation. Second, this study will extend the D&M Model, by testing the role of Workload as the moderating variable between two relationships namely, Net Benefits and Intention to Use (IV) to the Use (DV) of the Frog VLE. By examining these

moderating effects, the study aims to improve the explanation power D&M in the context of LMS implementation. Third, this study will also examine three Personal Characteristics as moderating variables, namely Age, Gender and Frog VLE Experience to the updated D&M. The body of literature thus far only calibrated to the assessment of the existing constructs or with the inclusion of certain external independent variables to fits the issues at hand. Nevertheless, the studies that examine the moderating effects of these personal characteristics are surprisingly scarce in D&M based literature, even though it have been empirically proved in other models like UTAUT and UTAUT 2. Finally, this study will use both constructs of Intention to Use and Use. Although Intention to Use is introduced as an alternative for Use, this study posits that both of these constructs are significant, especially to capture the issue of continuous usage.

In conclusion, this study aims to fill the gap as none of the existing studies to the knowledge of the researcher provides the determinants of Frog VLE success. The successful implementation of LMS relies on its ability to meet the users' requirement and expectation, while at the same time provide the net benefits for its users, regardless of the location, urban and rural. Thus, the outcome of the study will provide the guidelines and evidence for Malaysian policy makers especially the MOE to spot the weaknesses in the current practice of Frog VLE, for future improvement, as well as to justify their investment.

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